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EXAMINER

PHILPOTT, JUSTIN M

ART UNIT

PAPER NUMBER

2665

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/560,673

Applicant(s)

GOLDSTEIN ET AL.

Examiner

Justin M Philpott

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 14, 23-31 and 34-37 is/are rejected.
- 7) ☒ Claim(s) 12, 15-22, 32 and 33 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Objections*

1. Claims 3, 11, 12 and 16 are objected to because of the following informalities:

“shared-memory shared-memory switch fabrics” (claim 3, line 6) should be changed to “shared-memory switch fabrics”;

“packets form at least” (claim 11, line 3) should be changed to “packets from at least”;

the use of the term “coupling” (claim 12, line 2) is unclear; accordingly, “a notify ring coupling each port controller” should be changed to, e.g., “a notify ring coupling each port controller to [insert appropriate element(s), such as, ‘another of said port controllers’]”, “a notify ring coupled to each port controller”, or “each port controller coupled to the other port controllers via a notify ring” for clarity;

“by a port controller” (claim 12, line 5) should be changed to “by one of the port controllers” since this element appears to refer to one of the previously recited port controllers; and

“the packet buffer number and switch instance” (claim 16, lines 2-3) should be changed to “the packet buffer number and a switch instance” in order to maintain proper antecedent basis since the term “switch instance” first appears in claim 16. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 13, 14 and 34-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically, claims 13 and 14 recite the limitation “the shared buffer memory” in claim

1. There is insufficient antecedent basis for this limitation in the claim.

Claim 34 recites the limitation “the forwarding information” in claim 30. There is insufficient antecedent basis for this limitation in the claim. Applicant may overcome this rejection by amending claim 34 to be dependent upon claim 33 and not claim 30.

Claim 35 is rejected for being dependent upon a rejected base claim. Applicant may overcome this rejection by amending claim 34 as suggested above.

Claim 36 recites the limitation “the ingress port controller” in claim 30. There is insufficient antecedent basis for this limitation in the claim. Applicant may overcome this rejection by amending claim 36 to be dependent upon claim 35 and not claim 30, and amending claim 34 as suggested above.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-11, 13, 14, 23-31 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,621,818 to Szczepanek et al.

Regarding claims 1, 29 and 37, Szczepanek teaches a network switch having a hybrid switch architecture, comprising: at least two shared-memory switch fabrics (e.g., 20<sub>0</sub>-20<sub>2</sub>, see FIGS. 3 and 4a), each shared-memory switch fabric being configured to store and retrieve packets (e.g., see col. 5, line 10 – col. 8, line 14); and a crossbar switch fabric (e.g., 100 in FIG. 12), the crossbar switch fabric being coupled to each of the shared-memory switch fabrics and configured to distribute and re-collect packets to and from each of the shared-memory switch fabrics (e.g., see col. 23, line 1 – col. 27, line 54).

However, Szczepanek may not specifically disclose the architecture comprises at least a second crossbar switch fabric. That is, Szczepanek discloses an embodiment comprising one crossbar switch fabric (e.g., 100) accommodating sixteen switches.

However, Szczepanek further teaches that the system (shown generally in FIG. 2) may also support other connections in number and type (e.g., see col. 4, line 58 – col. 5, line 2) and also discloses that alternative arrangements of the crossbar switch system may also be implemented while remaining within the scope of the invention (e.g., see col. 26, line 57 – col. 27, line 23). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to include additional crossbar switch fabrics in order to provide a more robust system to accommodate a larger number of switches, as suggested by Szczepanek by disclosing that the system may also support other connections in number and type and that alternative arrangements of the crossbar switch system may also be implemented. Moreover, at the time of

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the invention it would have been obvious to one of ordinary skill in the art to provide a second crossbar switch fabric since it is generally considered to be within the ordinary skill in the art to duplicate parts for a multiplied effect. St. Regis Paper Co. v. Bemis Co., Inc., 193 USPQ 8, 11 (7<sup>th</sup> Cir. 1977).

Regarding claim 2, Szczepanek teaches the shared-memory switch fabric is an NxN shared-memory switch fabric, N being an integer greater than one, and wherein each shared-memory switch fabric includes N inputs for receiving packets (e.g., via send/receive ports 0-8, see FIG. 3) and N outputs for sending packets (e.g., via send/receive ports 0-8) on N channels (e.g., see col. 7, lines 1-3 regarding transmission channels handled by ports of the switch 20) and wherein at least one channel is coupled to the crossbar switch fabric (e.g., 100 via link at port 8, see FIG. 12 and col. 23, lines 1-54).

Regarding claims 3 and 28, Szczepanek teaches the crossbar switch fabric is an nxm crossbar switch fabric, n being an integer and m being an integer greater than one, and wherein the nxm crossbar switch fabric is coupled to n ports (e.g., 16 ports in FIG. 100) for receiving and transmitting packets from and to network ports and m channels (e.g., transmission channels) for distributing and re-collecting packets to and from the NxN shared-memory switch fabrics, and wherein at least one of the m channels is coupled with each NxN shared-memory switch fabric.

Regarding claims 4-10, 25 and 26, Szczepanek teaches the switch of claim 3, however, may not specifically disclose specifically m is an integer multiple of a total number of NxN shared-memory switch fabrics, N is 48, n and m are 8 or n is 1, the number of crossbar switch fabrics is 12, the number of shared-memory switch fabrics is 2, the number of channels is 4, aggregate data rate on m channels is greater than on n ports, and NxN connectivity is greater than

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nxm. However, it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value. The burden of showing criticality is on Appellant. In re Mason, 87 F.2d 370, 32 USPQ 242 (CCPA 1937); Marconi Wireless Telegraph Co. v. U.S., 320 U.S. 1, 57 USPQ 471 (1943); In re Schneider, 148 F.2d 108, 65 USPQ 129 (CCPA 1945); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955); In re Saether, 492 F.2d 849, 181 USPQ 36 (CCPA 1974); In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Thus, at the time of the invention it would have been obvious to one of ordinary skill in the art to implement the system of Szczepanek using the above parameters or values since it is generally considered to be within the ordinary skill in the art to adjust, vary, select or optimize the numerical parameters or values of any system absent a showing of criticality in a particular recited value.

Regarding claim 11, Szczepanek teaches a port controller (e.g., MAC 46 in FIG. 4a) coupled to the crossbar switch fabric (e.g., 100 in FIG. 12) and configured to retrieve packets from at least one network port (e.g., ports 0-7) and to forward packets to the crossbar switch fabric and configured to receive packets from the crossbar switch fabric and to forward packets to a destination network component via the at least one network port; and a shared buffer memory (e.g., RAM 22 in FIG. 3) coupled to each of the shared-memory switch fabrics configured to store temporarily packets distributed from the crossbar switch fabrics (e.g., see col. 5, line 3 – col. 9, line 54).

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Regarding claims 13, 14, 27 and 31, Szczepanek teaches the crossbar switch and shared-memory switch fabrics are configured to distribute and store, respectively, packets in the shared buffer memory (e.g., RAM 22) (e.g., see col. 7, line 1 – col. 11, line 29).

Regarding claim 23, Szczepanek teaches the packets are data packets for an Ethernet network (e.g., see col. 4, lines 41-43).

Regarding claim 24, while Szczepanek may not specifically disclose packets are data cells for an ATM network, Szczepanek teaches the invention may be applied to packet-switched networks of various protocols and communication types (e.g., see col. 4, lines 28-32), and Examiner takes official notice that an ATM network is a well known packet-switched network.

Regarding claim 30, Szczepanek teaches removing header or control information from received packets before distribution (e.g., see col. 6, lines 21-26).

***Allowable Subject Matter***

6. Claims 12, 15-22, 32 and 33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. Claims 34-36 would be allowable if rewritten, as suggested above, to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter:



claim 12 recites the limitation of port controllers each coupled to one another in a notify ring configuration, wherein the notify ring is configured to transfer forwarding information to each of the port controllers, and wherein the forwarding information is used to request packets from the shared-memory switch fabrics by a port controller;

claim 32 recites the limitation of sending a packet buffer number and a switch instance for each packet stored by each shared-memory switch fabric to an ingress port controller, the packet buffer number including information indicating where the packet is stored in the shared buffer memory and the switch instance including information which shared-memory switch fabric stored the packet; and

claims 15-22 and 33-36 include further limitations of claims 12 and 32, respectively, and therefore also comprise allowable subject matter.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 5,583,861 to Holden discloses a switching element and method having independently accessible cell memories, and U.S. Patent No. 6,141,344 to DeLong discloses a mechanism for distributed address cache in a network switch.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin M Philpott whose telephone number is 703.305.7357. The examiner can normally be reached on M-F, 9:00am-5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D Vu can be reached on 703.308.6602. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4750.



Justin M Philpott



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